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C-12A IN-FLIGHT CREW NOISE(U) AIR FORCE AEROSPACE
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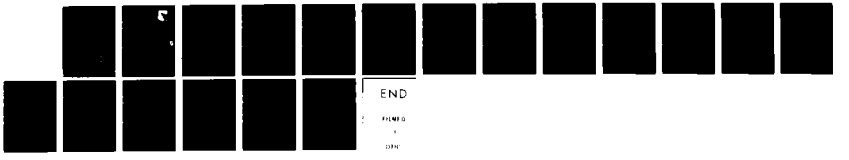

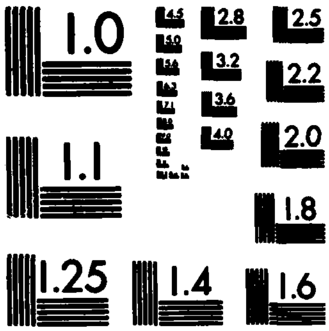

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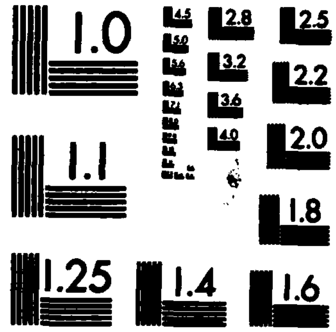

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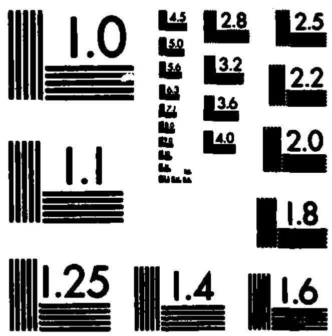
NATIONAL BUREAU OF STANDARDS-1963-A



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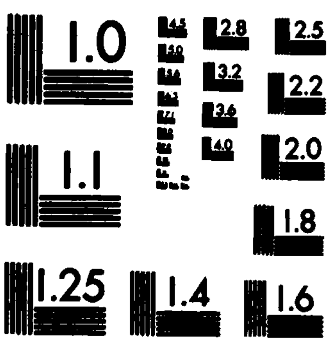

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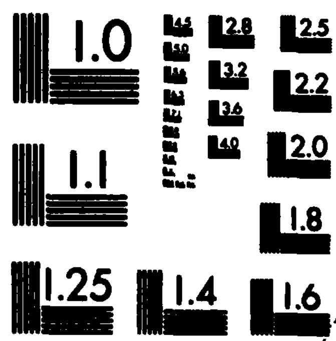

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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AMRL-TR-75-50
Volume 152

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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 152

C-12A IN-FLIGHT CREW NOISE

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AEROSPACE MEDICAL DIVISION
AIR FORCE SYSTEMS COMMAND
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AMRL-TR-75-50, Vol. 152

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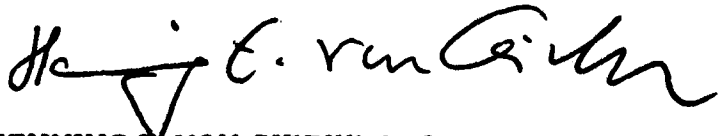
This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER



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Biodynamics and Bioengineering Division
Air Force Aerospace Medical Research Laboratory

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20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The C-12A is a military version of the Beechcraft Super King Air 200. This report provides measured data defining the bioacoustic environments at flight crew/passenger locations inside this aircraft during normal flight operations. Data are reported for five locations in a wide variety of physical and psychoacoustic measures: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, —

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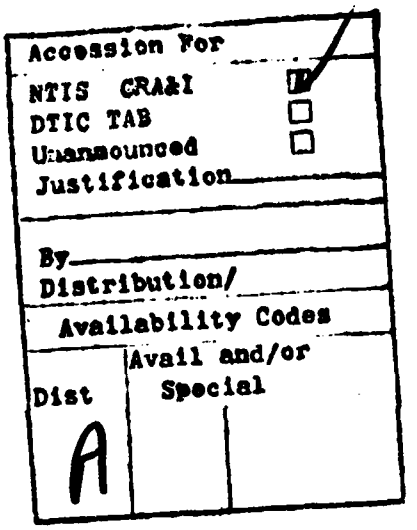
perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol. 1: Organization, Content and Application," AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc.

PREFACE

This report was prepared by the Biodynamic Environment Branch, Air Force Aerospace Medical Research Laboratory, under Project/Task 723109, Communication and Performance Capability and Operational Noises. The author acknowledges the efforts of Mr. John Cole who established the data analysis requirements, Mr. Henry Mohlman, and Mr. Fred Lampley of the University of Dayton who assisted in the mechanics of data processing and Mrs. Norma Peachey who typed this report and prepared it for publication.



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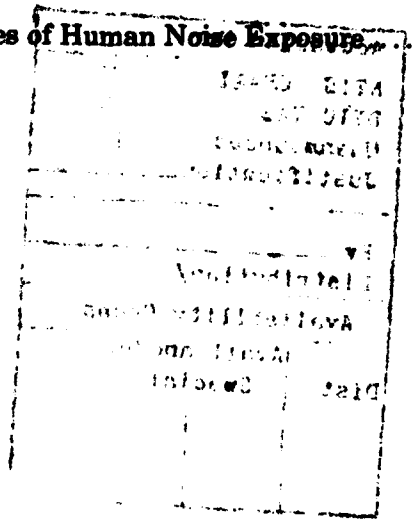

INTRODUCTION

The C-12A is a military version of the Beechcraft Super King Air 200 and is used for operational support airlift. This aircraft is manufactured by the Beech Aircraft Corporation and is powered by two PT6A-38 turboprop engines each rated at 750 shp. The engines are manufactured by the Pratt & Whitney Aircraft Division of Canada.

This volume provides measured and extrapolated data defining bioacoustic environments produced inside the aircraft. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with operations of the C-12A aircraft.

This volume is one of a series published by the Air Force Aerospace Medical Research Laboratory (AFAMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type, noise data in the handbook describe the noise produced during operations of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definition of quantities, symbols, equations, applications, limitations, etc. Refer to Volume 1 (reference 1) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published.

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1. Cole, John N., USAF Bioenvironmental Noise Data Handbook, Volume 1: Organization, Content and Application, AMRL-TR-75-50(1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

IN-FLIGHT NOISE

MEASUREMENTS

All noise measurements were made on-board a standard-configured C-12A aircraft during typical speed, altitude, and flight maneuver conditions. These levels describe the standard C-12A environments, but may not be representative of those levels encountered if the aircraft has been configured differently (e.g., major equipment or structural changes).

Acoustic measurements were made at various flight crew and passenger locations. Table 1 lists the measurement locations and test conditions as numeric/alphabetic designators which are used on the data pages. The designator 1/A means measurement location 1 and test condition A.

The microphone position was at ear level external to headgear in a region 0.2-0.3 meter from the head when an individual was present. At unoccupied locations, measurements were made at ear level throughout a volume where the head would normally be located. In both cases, the microphone was randomly moved throughout a spherical volume approximately 0.3 meter in diameter and the resultant samples analyzed using a 4- or 8- second integration time to obtain a power-averaged level, which effectively smooths out short-duration fluctuations and best describes the exposure.

Although the presence of a crew member or passenger at a measurement location affects the resultant sound field, the magnitude of such effects is generally small and not significant in determining exposure limits or voice communication capabilities. Consequently, no distinction is made in this report between occupied and unoccupied measurement locations.

RESULTS

The measured data presented in Table 2 define the sound pressure levels (SPL) produced inside the C-12A aircraft at the five specific locations. This table includes the overall, 1/3 octave band, and octave band levels. From these data, C-weighted and A-weighted sound levels, maximum permissible time for one exposure per day (AFR 161-35 with and without standard Air Force ear protectors, preferred speech interference level, and perceived noise level are calculated and presented in Table 3. These measures are widely used to assess the effects of noise on personnel and their performance.

TABLE 1

MEASUREMENT LOCATIONS AND TEST CONDTIONS

C-12A, Andrews AFB, 8 June 1982

LOCATION	POSITION	HEIGHT ABOVE DECK
1	Pilot/Copilot	Seated Head Level
2	First Row Seats, Centerline	Seated Head Level
3	Second Row Seats, Centerline	Seated Head Level
4	Third Row Seats, Centerline	Seated Head Level
5	Aft Aircraft Storage Area	Seated Head Level

CONDITION	DESCRIPTION
A	Engine Start, Both Engines Idle, Taxi
B	High Speed, Ground, Idle 900 RPM
C	Military Ground Runup 1800 RPM
D	Takeoff/Roll
E	Liftoff, Gear Up, Climb to 5000 ft., 2000 RPM
F	Climb thru 5000 ft., 1900 RPM
G	Climb thru 10000 ft.
H	Cruise 24000 ft. - 1900 RPM, 170 KIAS
I	Cruise 24000 ft. - 2000 RPM (High Speed)
J	Cruise 24000 ft. - 1900 RPM
K	Cruise 24000 ft. - 1800 RPM
L	Cruise 24000 ft. - 1700 RPM
M	Descending to 1500 ft. - 1900 RPM
N	Cruise 15000 ft. - 2000 RPM
O	Cruise 15000 ft. - 1900 RPM
P	Cruise 15000 ft. - 1800 RPM
Q	Cruise 15000 ft. - 1700 RPM
R	Cruise 8000 ft. - 2000 RPM
S	Cruise 8000 ft. - 1900 RPM
T	Cruise 8000 ft. - 1800 RPM
U	Cruise 8000 ft. - 1700 RPM
V	Approach 1500 ft. - 1700 RPM
W	Simulated Missed Approach
X	Approach 1500 ft. - 2000 RPM, Gear Down
Y	Landing Roll

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
2

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 01
15 JUL 82
PAGE F1

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	1/I	2/I	3/I	4/I	5/I
25	97	99	88	90	84	82	76	79	80	77	70	71	79
31.5	77	85	86	87	82	83	85	82	80	81	87	85	82
40	72	80	79	85	83	82	82	82	83	81	88	84	83
50	75	81	81	83	87	84	78	84	84	79	86	85	78
63	82	86	85	85	90	85	85	82	82	85	81	84	81
80	70	81	95	85	89	90	85	81	81	77	81	77	78
100	69	77	108	102	107	105	100	96	94	94	95	91	96
125	75	81	84	86	91	85	81	82	82	82	80	80	82
160	82	87	89	83	88	85	83	81	82	81	80	79	79
200	78	83	90	95	101	93	90	90	97	96	92	87	84
250	73	84	90	85	88	90	85	84	84	83	80	77	77
315	67	82	88	95	97	96	88	91	90	89	83	79	78
400	66	81	91	89	89	89	85	91	92	86	81	77	77
500	67	74	85	83	85	87	82	86	87	83	82	78	78
630	67	72	84	77	81	83	78	86	86	82	81	79	77
800	72	68	81	75	81	81	76	83	82	79	78	77	74
1000	66	67	83	72	81	85	75	78	78	82	79	78	74
1250	61	64	79	70	80	89	75	75	75	80	76	75	71
1600	63	61	73	70	76	84	68	69	70	79	71	67	66
2000	65	59	69	66	72	81	63	67	68	72	68	63	63
2500	66	57	68	63	70	79	60	63	63	68	66	62	61
3150	58	55	61	59	65	69	58	60	61	60	60	59	58
4000	57	56	60	58	64	63	58	60	60	58	57	57	58
5000	55	55	59	57	62	61	62	58	59	56	57	56	57
6300	54	54	59	56	61	59	55	57	58	54	55	56	57
8000	54	54	59	56	61	58	55	59	58	54	54	55	56
10000	54	53	60	56	59	57	55	56	56	53	53	56	57
OVERALL	97	100	105	104	109	106	101	101	101	100	99	95	98

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND

IDENTIFICATION:
OMEGA 9.2
TEST BZ-082-001
RUN 02
15 JUL 82
PAGE F2

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/J	1/K	1/L	1/M	1/N	2/N	3/N	4/N	5/N	1/O	1/P	3/P	1/Q
25	81	80	82	80	83	77	72	73	82	81	81	82	75
31.5	78	76	80	77	80	83	85	84	82	82	78	79	80
40	83	82	82	82	83	83	87	86	83	84	85	85	87
50	85	84	84	85	88	83	84	88	79	88	88	88	85
63	84	83	82	83	87	86	84	86	83	87	87	86	85
80	83	86	93	82	84	79	81	80	79	85	92	102	96
100	95	89	86	93	97	94	94	96	94	96	96	95	88
125	81	80	81	81	85	82	82	83	83	83	84	84	80
160	83	85	89	84	84	82	81	82	82	87	89	90	87
200	95	88	82	96	99	96	91	86	89	99	91	84	81
250	83	89	89	84	86	84	79	79	79	88	92	91	81
315	86	85	83	89	92	89	83	82	81	92	87	86	80
400	86	82	81	88	90	85	82	80	78	89	86	85	79
500	87	82	79	86	88	85	86	81	80	87	84	83	82
630	83	79	78	82	86	85	85	80	78	83	81	81	83
800	78	76	74	78	82	82	82	78	76	84	79	78	81
1000	77	76	75	79	81	83	83	82	77	85	77	77	82
1250	73	72	72	74	84	84	81	77	73	86	76	75	82
1600	69	68	68	71	86	84	71	68	67	85	71	71	73
2000	67	66	65	67	84	74	67	64	63	77	69	69	67
2500	63	62	62	63	78	70	63	62	61	71	65	65	63
3150	60	59	59	61	65	62	61	59	59	63	62	62	61
4000	60	59	59	61	64	61	59	57	58	62	61	61	59
5000	58	58	57	59	63	60	59	56	57	61	60	60	58
6300	56	55	54	57	61	58	57	56	58	57	57	57	57
8000	56	53	53	57	61	57	57	57	58	57	56	56	56
10000	54	53	52	55	59	56	56	57	59	57	56	55	56
OVERALL	100	97	97	100	103	100	98	99	97	103	101	104	99

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)
1/3 OCTAVE BAND
2

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 03
15 JUL 82
PAGE F3

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/R	2/R	3/R	4/R	5/R	1/S	1/T	1/U	1/V	1/W	1/X	1/Y
25	82	78	72	74	81	83	82	81	78	80	82	97
31.5	83	86	87	84	84	81	79	80	75	79	81	97
40	84	83	89	86	82	84	83	82	75	81	84	91
50	88	83	84	87	76	88	87	85	80	84	85	89
63	88	87	85	87	84	87	87	87	83	85	88	92
80	85	82	83	84	83	87	98	99	85	85	83	94
100	97	97	98	101	100	98	101	90	78	100	93	89
125	85	84	84	86	86	85	85	83	76	83	84	88
160	86	83	83	84	85	87	90	89	80	81	86	91
200	99	94	94	90	92	98	92	84	78	91	91	86
250	87	85	83	82	82	91	91	87	80	84	88	86
315	93	87	84	84	84	94	87	85	76	90	87	87
400	93	85	83	82	82	89	88	84	75	83	86	87
500	88	84	82	82	81	89	86	84	75	79	82	83
630	86	84	80	80	81	84	82	81	74	78	81	81
800	84	80	80	79	79	82	80	79	71	75	79	80
1000	84	79	86	80	78	80	78	78	70	74	74	81
1250	81	79	80	76	76	78	76	76	67	72	72	84
1600	84	74	71	68	71	74	72	71	63	70	68	80
2000	81	68	68	65	68	69	69	68	60	67	67	75
2500	77	65	65	63	66	66	66	65	57	63	63	73
3150	66	60	62	61	64	63	62	60	53	60	61	65
4000	66	58	60	58	62	61	61	59	53	59	58	63
5000	62	56	58	57	61	60	59	58	51	58	58	63
6300	60	54	57	57	61	58	57	56	50	56	56	62
8000	59	54	56	58	63	59	57	56	50	55	56	62
10000	58	54	56	57	62	57	57	56	51	54	56	62
OVERALL	103	101	101	102	101	103	104	101	91	101	99	103

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 01

15 JUL 82

PAGE J1

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	1/I	2/I	3/I	4/I	5/I
31.5	97	99	88	93	88	87	87	86	86	84	91	88	86
63	83	88	95	89	93	92	88	87	87	86	88	88	84
125	83	88	103	102	107	105	100	96	94	95	95	92	96
250	79	88	94	98	102	98	93	98	98	97	93	88	85
500	71	82	92	90	91	91	87	93	93	89	86	83	82
1000	73	71	86	77	85	90	80	84	84	85	83	82	78
2000	69	64	74	72	78	86	69	72	73	80	74	69	69
4000	61	60	65	63	68	70	64	64	65	63	63	62	62
8000	59	58	64	61	65	63	60	62	62	58	59	60	61
OVERALL	97	100	105	104	109	106	101	101	101	100	99	95	98

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 02
15 JUL 82
PAGE J2

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/J	1/K	1/L	1/M	1/N	2/N	3/N	4/N	5/N	1/O	1/P	3/P	1/Q
31.5	85	85	86	84	87	86	89	88	87	87	87	87	88
63	89	89	94	88	91	88	88	90	86	91	94	102	96
125	95	91	91	94	97	94	94	97	95	97	97	96	91
250	96	92	90	97	100	97	92	88	90	100	95	93	85
500	90	86	84	90	93	90	90	85	84	92	89	88	86
1000	81	80	78	82	87	88	87	84	80	90	82	82	86
2000	72	71	70	73	89	84	73	70	69	85	74	74	74
4000	64	63	63	65	69	66	64	62	63	67	66	66	64
8000	60	58	58	61	65	62	61	61	63	62	61	61	61
OVERALL	100	97	97	100	103	100	98	99	97	103	101	104	99

TABLE: 2 MEASURED SOUND PRESSURE LEVEL (DB) OCTAVE BAND

IDENTIFICATION:
OMEGA 3.2
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15 JUL 82
PAGE J3

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

FREQ (HZ)	LOCATION/CONDITION 1/R	2/R	3/R	4/R	5/R	1/S	1/T	1/U	1/V	1/W	1/X	1/Y
31.5	88	88	91	88	87	88	86	86	81	85	87	101
63	92	89	89	91	87	92	98	99	88	89	91	97
125	98	98	98	101	100	99	102	93	83	100	94	94
250	100	95	95	91	93	100	95	90	83	94	94	91
500	95	89	87	86	86	93	91	88	79	85	88	89
1000	88	84	87	83	83	85	83	83	74	78	81	87
2000	86	75	73	70	74	75	74	73	65	72	71	82
4000	70	63	65	64	67	66	65	64	57	64	64	69
8000	64	59	61	62	67	63	62	61	55	59	61	67
OVERALL	103	101	101	102	101	103	104	101	91	101	99	103

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 01

15 JUL 82

PAGE H1

	LOCATION/CONDITION												
	1/A	1/B	1/C	1/D	1/E	1/F	1/G	1/H	1/I	2/I	3/I	4/I	5/I
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	94	97	105	104	109	106	101	101	101	100	98	95	97
OASLA	78	83	93	92	96	96	88	93	93	91	88	85	84
T	960	571	101	120	60	60	240	101	101	143	240	404	480
H-157 IN-FLIGHT COMMUNICATION UNIT													
OASLA*	66	72	83	83	88	84	79	81	81	80	77	73	75
T	960	960	571	571	240	480	960	807	807	960	960	960	960
V-51R EAR PLUGS													
OASLA*	56	63	71	72	75	74	68	71	71	69	66	63	63
T	960	960	960	960	960	960	960	960	960	960	960	960	960
MINIMUM GPL EAR MUFFS													
OASLA*	64	70	83	82	87	84	79	79	78	77	76	72	76
T	960	960	571	679	285	480	960	960	960	960	960	960	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	71	72	84	80	85	89	79	83	83	85	81	78	76
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	93	97	109	108	113	112	106	108	108	107	104	100	102
C	2	1	2	3	3	3	3	3	2	2	2	2	3

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:

OMEGA 3.2
TEST BZ-082-001
RUN 02

15 JUL 82

PAGE H2

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

	LOCATION/CONDITION												
	1/J	1/K	1/L	1/M	1/N	2/N	3/N	4/N	5/N	1/O	1/P	3/P	1/Q
HAZARD/PROTECTION													
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR													
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR													
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)													
NO PROTECTION													
OASLC	99	96	97	100	103	100	98	98	97	103	101	103	98
OASLA	90	87	86	91	95	93	91	88	86	95	90	90	89
T	170	285	339	143	71	101	143	240	339	71	170	170	202
H-157 IN-FLIGHT COMMUNICATION UNIT													
OASLA*	79	76	76	79	82	79	76	76	75	82	80	82	76
T	960	960	960	960	679	960	960	960	960	679	960	679	960
V-51R EAR PLUGS													
OASLA*	69	66	65	70	73	70	68	66	64	73	69	69	66
T	960	960	960	960	960	960	960	960	960	960	960	960	960
MINIMUM GPL EAR MUFFS													
OASLA*	77	73	74	77	80	77	75	76	75	80	78	81	75
T	960	960	960	960	960	960	960	960	960	960	960	807	960
COMMUNICATION													
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)													
PSIL	81	79	78	82	90	87	83	80	78	89	82	81	82
ANNOYANCE													
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)													
TONE CORRECTION (C IN DB)													
PNLT	106	102	101	106	111	108	104	104	102	110	105	106	103
C	2	1	1	2	2	2	2	2	2	2	1	1	2

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

TABLE: MEASURES OF HUMAN NOISE EXPOSURE

3

IDENTIFICATION:
OMEGA 3.2
TEST BZ-082-001
RUN 03
15 JUL 82
PAGE H3

NOISE SOURCE/SUBJECT:
C-12A
IN-FLIGHT CREW NOISE

OPERATION:

	LOCATION/CONDITION											
	1/R	2/R	3/R	4/R	5/R	1/S	1/T	1/U	1/V	1/W	1/X	1/Y
HAZARD/PROTECTION												
C-WEIGHTED OVERALL SOUND LEVEL (OASLC IN DBC) AT EAR												
A-WEIGHTED OVERALL SOUND LEVEL (OASLA IN DBA) AT EAR												
MAXIMUM PERMISSIBLE TIME (T IN MINUTES) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73)												
NO PROTECTION												
OASLC	103	100	101	102	101	103	104	101	90	101	98	102
OASLA	95	90	91	89	89	94	91	89	80	89	89	91
T	71	170	143	202	202	85	143	202	960	202	202	143
M-157 IN-FLIGHT COMMUNICATION UNIT												
OASLA*	83	79	79	80	80	82	82	79	68	80	77	78
T	571	960	960	960	960	679	679	960	960	960	960	960
V-51R EAR PLUGS												
OASLA*	73	69	69	67	67	73	70	68	59	68	68	69
T	960	960	960	960	960	960	960	960	960	960	960	960
MINIMUM GPL EAR MUFFS												
OASLA*	81	78	79	80	79	81	82	78	67	80	76	77
T	807	960	960	960	960	807	679	960	960	960	960	960
COMMUNICATION												
PREFERRED SPEECH INTERFERENCE LEVEL (PSIL IN DB)												
PSIL	90	83	83	80	81	84	83	81	73	79	80	86
ANNOYANCE												
PERCEIVED NOISE LEVEL, TONE CORRECTED (PNLT IN PNDB)												
TONE CORRECTION (C IN DB)												
PNLT	111	106	106	107	106	109	108	104	94	106	103	105
C	2	2	2	3	3	2	2	1	1	3	2	1

* BASED ON CALCULATED SPL SPECTRUM UNDER PROTECTIVE DEVICE.

* U.S. GOVERNMENT PRINTING OFFICE: 1980—620-000/2000